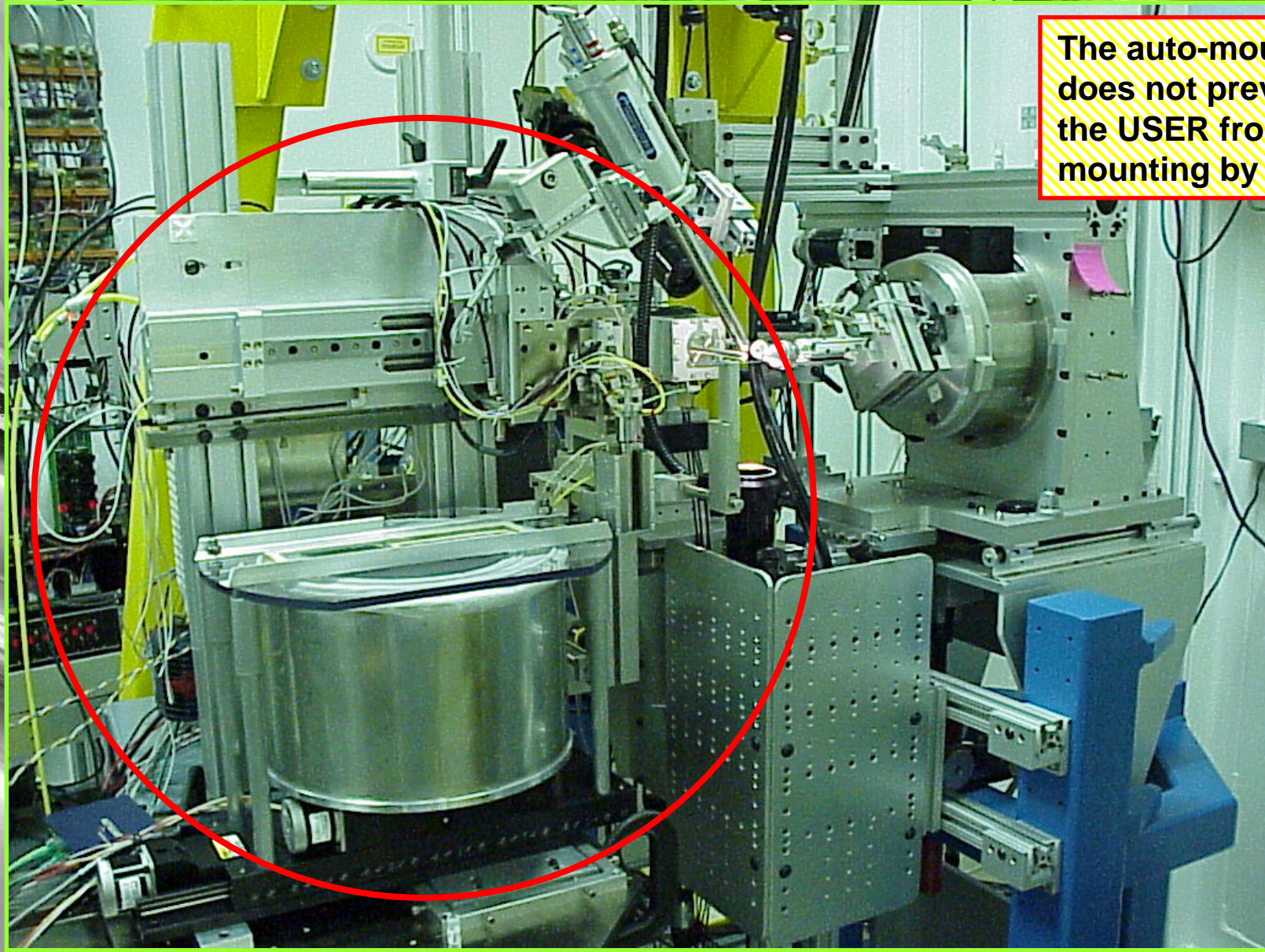


The BM-22 SER-CAT Berkeley Robot

The auto-mounter does not prevent the USER from mounting by hand



Berkeley auto-mounter sample changer is shown in the LHS of the picture

SER-CAT has installed an automatic cryogenic mounting system on the BM-22 beamline. Sample alignment is simplified through the interactive SER-GUI software interface.

The auto-mounter has random access to 96 samples, mounted in a precision engineered cryogenic dewar of liquid nitrogen.

Mounting of a crystal takes less than 5 seconds, during which the crystal temperature is maintained well below 120 K.

Centering of a crystal can be done by the user through the remote controlled xyz goniometer.



A sample transport/storage system based on "puck-shaped" cassettes, holds 16 samples each.

Seven cassettes fit into a standard dry shipping Dewar.



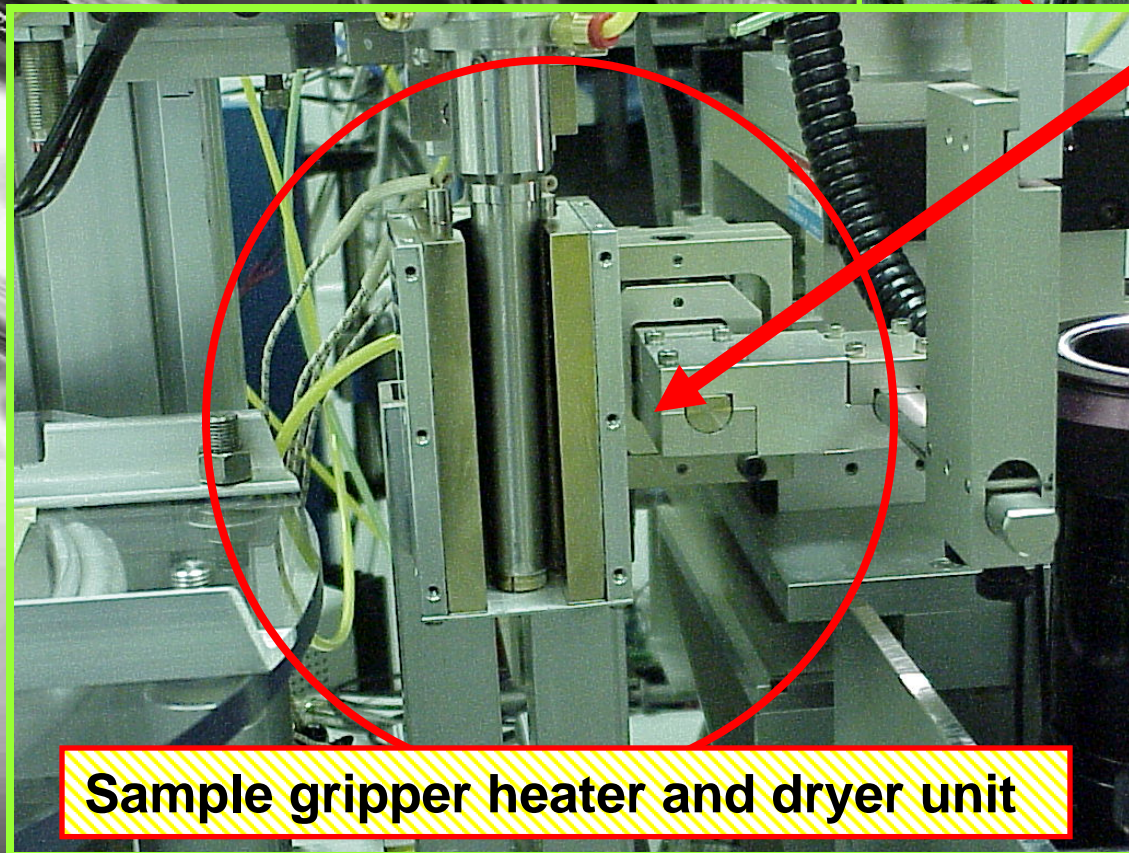
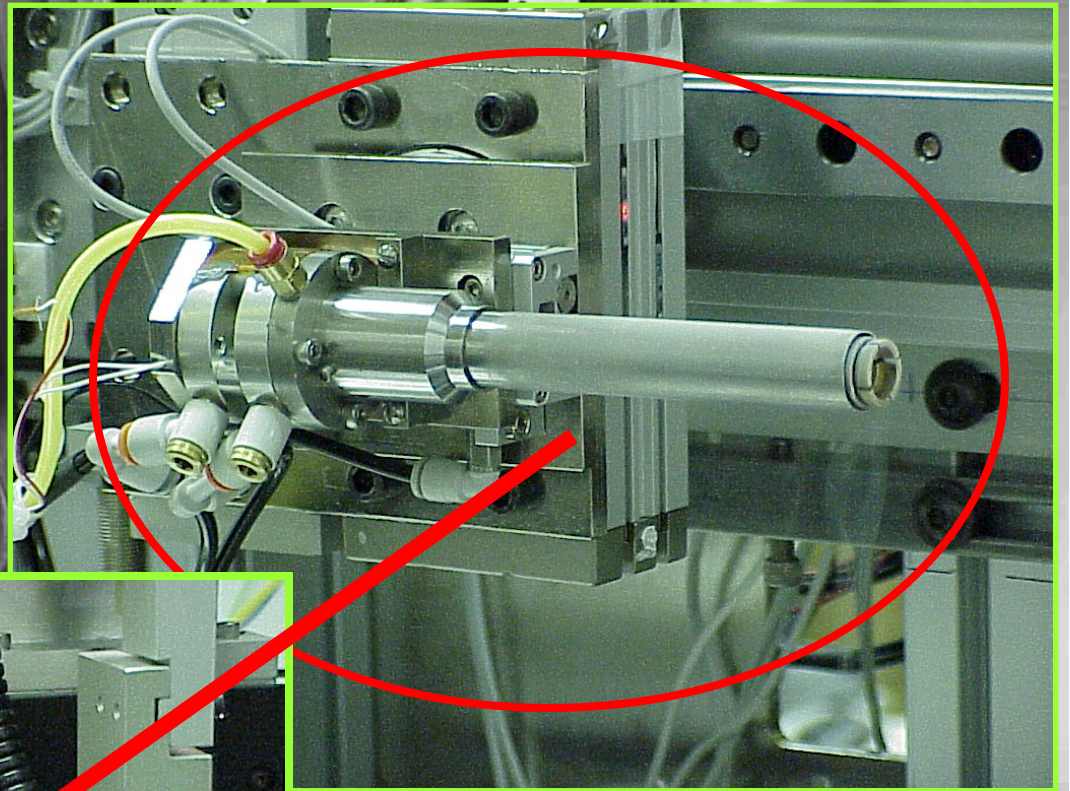
Crystals to be used with the auto-mounter must be mounted on ***CUSTOM MADE CAPS ONLY.***

The auto-mounter transfers all protein crystals at liquid nitrogen cryogenic temperatures very efficiently.

The sample gripper defines the *sample length, sample pin style and magnetic cap design.*

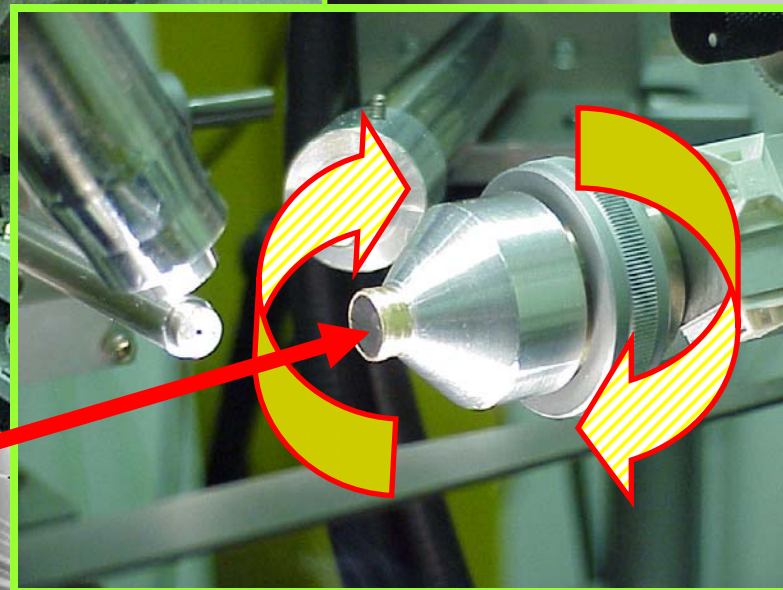
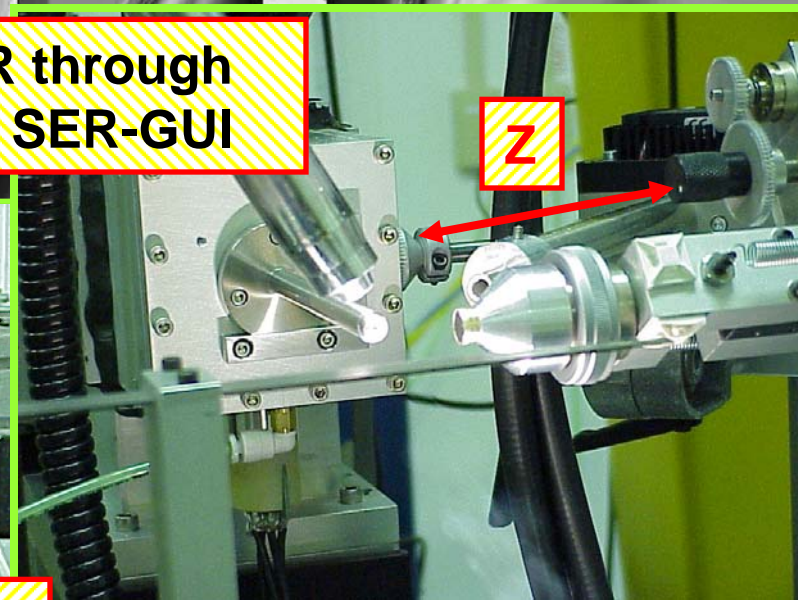
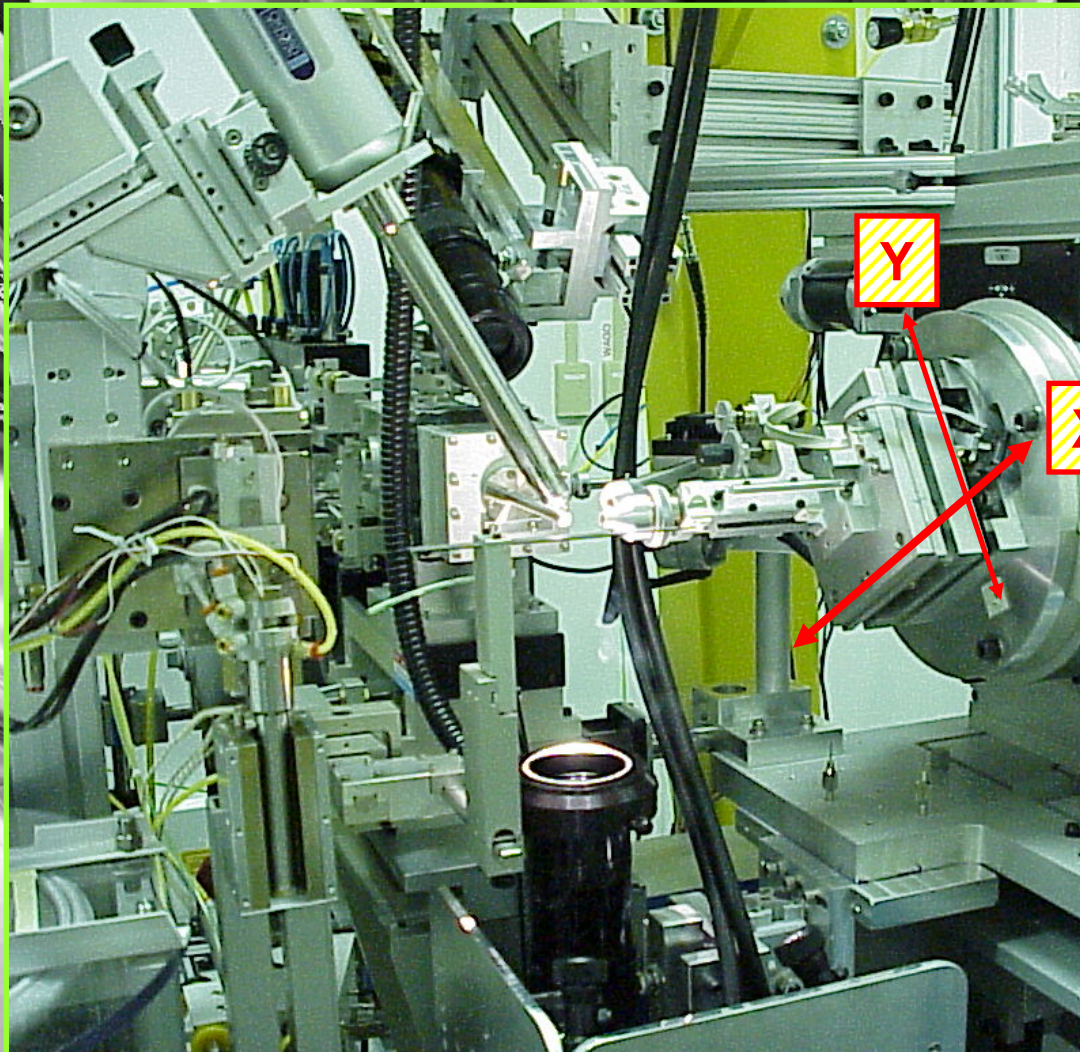
To minimize icing during the transfer step and also in the liquid nitrogen of the dewar, the auto-mounter is heated and air dried during each transfer.

The cool down step to cryogenic temperature is rapid before the mount or demount stages of sample transfer.



Sample gripper heater and dryer unit

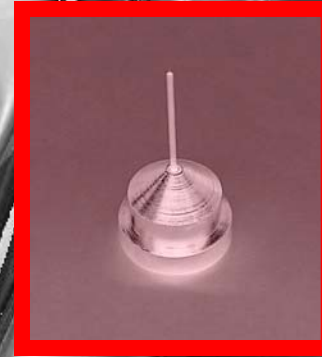
Centering of a crystal is done by the USER through the remote controlled xyz goniometer and SER-GUI



The omega circle is fitted with a simplified fixed-height goniometer head



The sample gripper defines the *sample length*, *sample pin style* and *magnetic cap design*.



'special' Berkley auto-mounter magnetic cap




The *magnetic cap design* is conical rather than having a lip as the classic Hampton caps



The sample gripper defines the *sample length*, *sample pin style* and *magnetic cap design*.

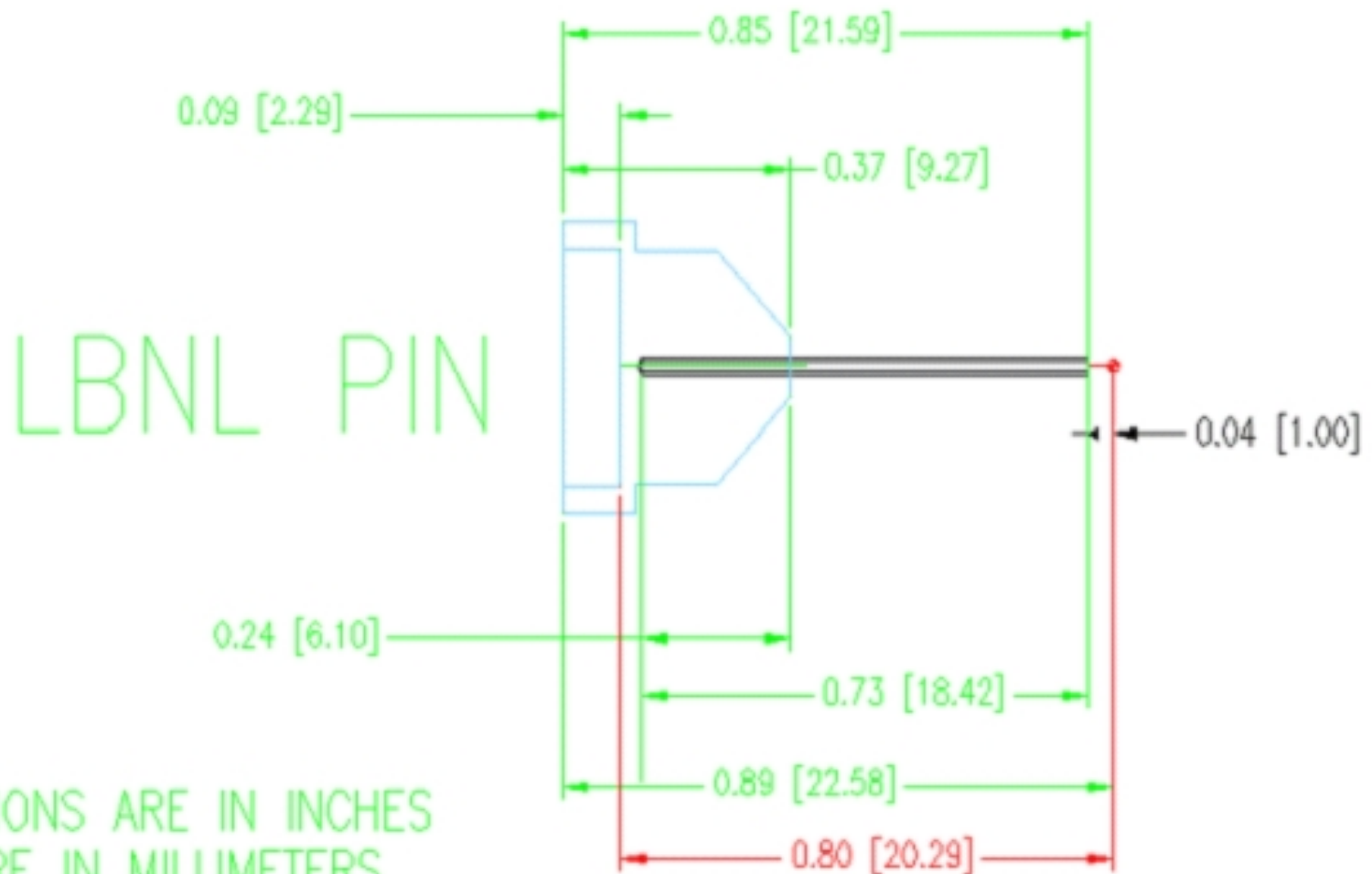
The total *sample length* (including the sample loop) is 22.5mm +/- 0.3 mm [the length from the inner surface of the cap that mounts to the magnet to the sample loop 20.5mm +/- 0.3 mm]

'special' Berkley auto-mounter magnetic cap



The *sample pin style* is a Hampton Research 18mm micropin (when glued into the 'special' magnetic cap, the micro-pin extends 13mm from the top of the cap. A loop typically adds 1mm of additional length.

A CAD sketch of the auto-mounter *magnetic cap* and *micro-pin* design.



DIMENSIONS ARE IN INCHES
[XX] ARE IN MILLIMETERS

“special” magnetic caps for the auto-mounter can be ordered from:

Base supplier	Quantity	Price/Each \$	Minimum Purchase \$
Vineburg Machines* (707)-938-8523	1000	\$ 2.10 each	\$ 2,100
Hampton Research Part No. HR4-779	60	\$ 2.30 each	\$ 140

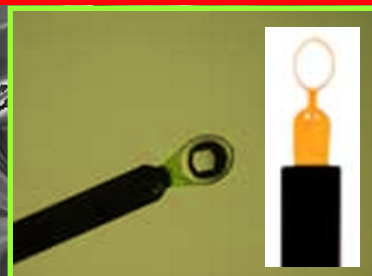
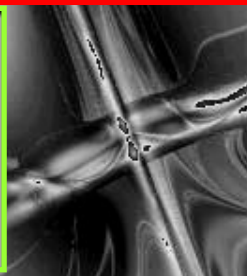
*** Price estimates for other quantities can be obtained by calling Vineburg Machines directly.**



The sample pin style is a Hampton Research 18mm micropin (when glued into the 'special' magnetic cap, the micro-pin extends 13mm from the top of the cap). A loop typically adds 1mm of additional length.

Micro-pin supplier	Quantity	Price/Each \$	Minimum Purchase \$
Hampton Research micropin 18mm Part No. HR4-921 (no sample loop)	60	\$ 0.82 each	\$ 49
Hampton Research Part No. HR4-955 (0.1-0.2mm mounted sample loop)	25	\$ 2.20 each	\$ 55
Molecular Dimensions Inc. Part No. MD7-63USA (0.1mm mounted litholoop	20 	\$ 2.70 each	\$ 54 

Hampton Research mounted cryoloops can be used by breaking off the bottom two sections of the micropin and gluing the remaining micropin into the 'special' magnetic cap. 20 micron nylon HR cryoloops, or *Molecular Dimensions 18 mm height pre-mounted Litholoops* recommended

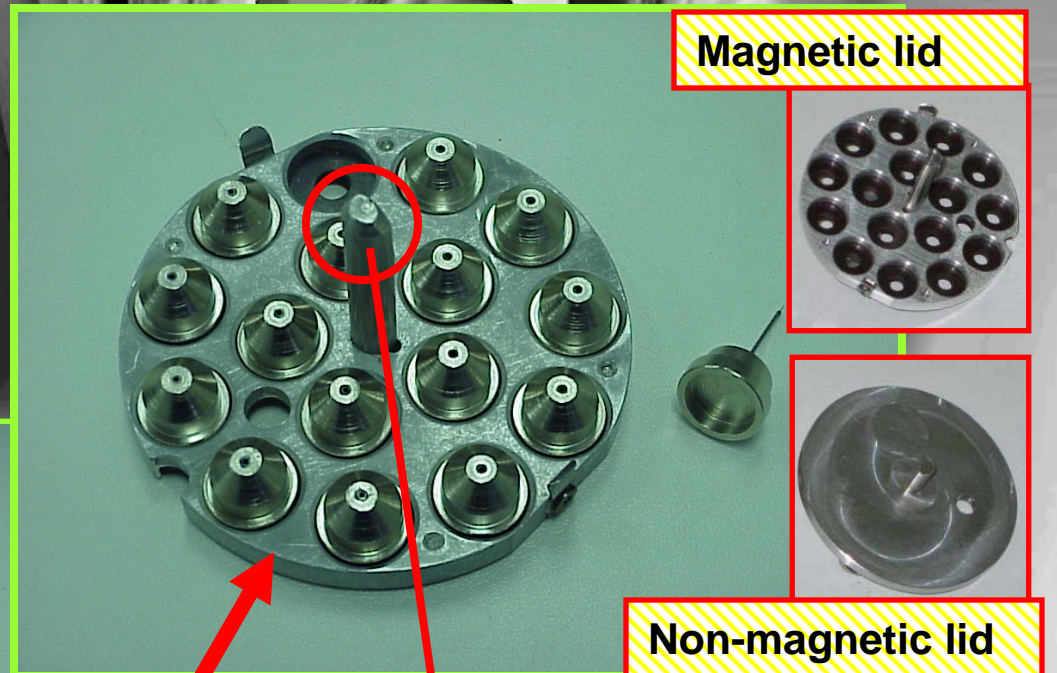


A sample transport/storage system based on "puck-shaped" cassettes, holds 16 samples each.

The magnetic puck lid is machined to have a unique orientation to the puck base

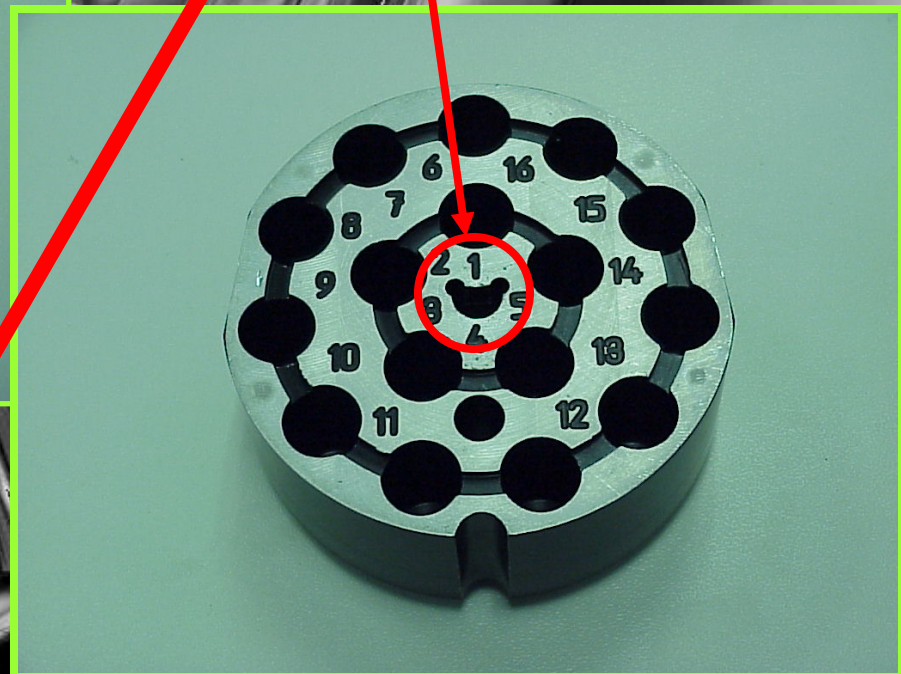


The puck base is filled with 16 'special' magnetic caps and pins in the home laboratory and a lid is clipped into place to secure the samples for storage under nitrogen.



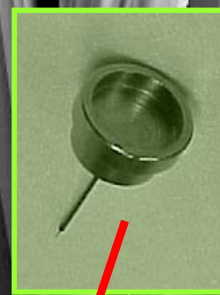
Magnetic lid

Non-magnetic lid

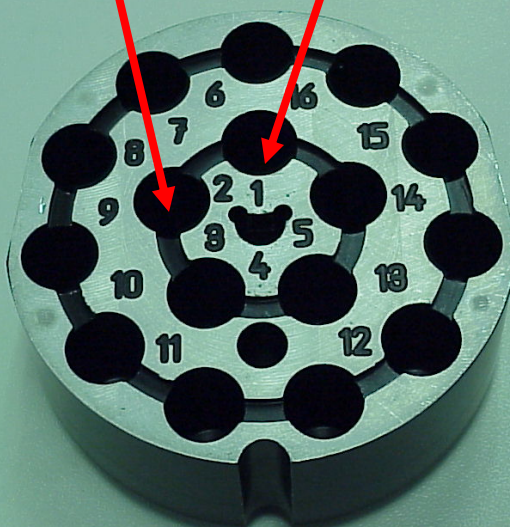




Magnetic lid



Non-magnetic lid



Protein crystals are mounted directly into the cryogenically cooled puck base which is in a dewar of liquid nitrogen.

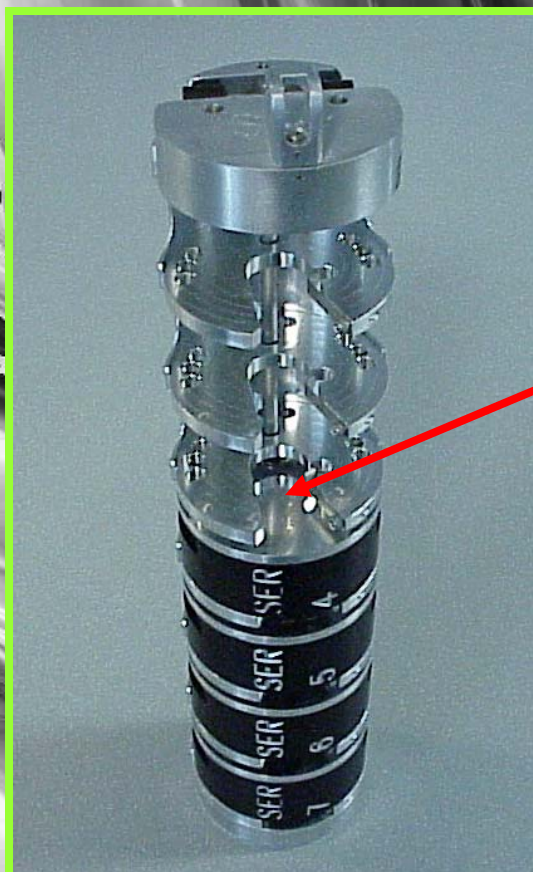
The puck base is filled with 16 'special' magnetic caps and pins in the home laboratory and a *non-magnetic lid* is attached to secure the samples for long term storage at the home lab.

For transport to the beamline for use with the auto-mounter, use the *magnetic lid* to close the puck.



Puck clip secures lid

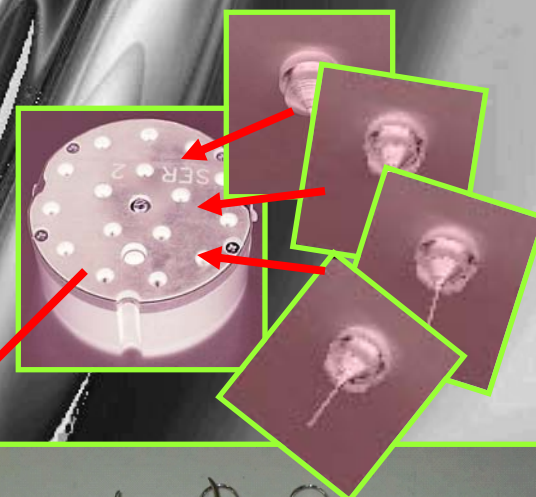
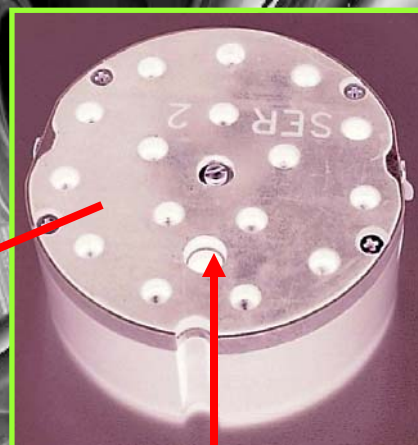
Puck carrier



Cryocooled pucks are loaded into the cryocooled puck carrier.

7 pucks can be loaded into the puck carrier.

Working in liquid nitrogen, protein crystals are mounted directly into the cryocooled puck base for use with the sample auto-mounter.



The puck carrier includes a safety rod that locks pucks into the carrier for transport in a Taylor-Wharton dry shipper dewar



Puck handling toolkit

Puck Mounting tools and auto-mounter requirements: the auto-mounter requires a puck tool set, pucks and lids.

Quantity	Item	Price / Each \$	Total \$
1	10" bent cryo tong	\$ 130	\$ 130
1	10" straight cryo tong	\$ 130	\$ 130
1	Puck pusher	\$ 150	\$ 150
1	Puck wand	\$ 150	\$ 150
7	Cryo puck SER-CAT modified *	\$ 60	\$ 420
7	Magnetic cryo puck lid	\$ 110	\$ 770
1	Cryo puck shipping cane	\$1000	\$ 1000
1	Puck separator tool	\$ 350	\$ 3,100



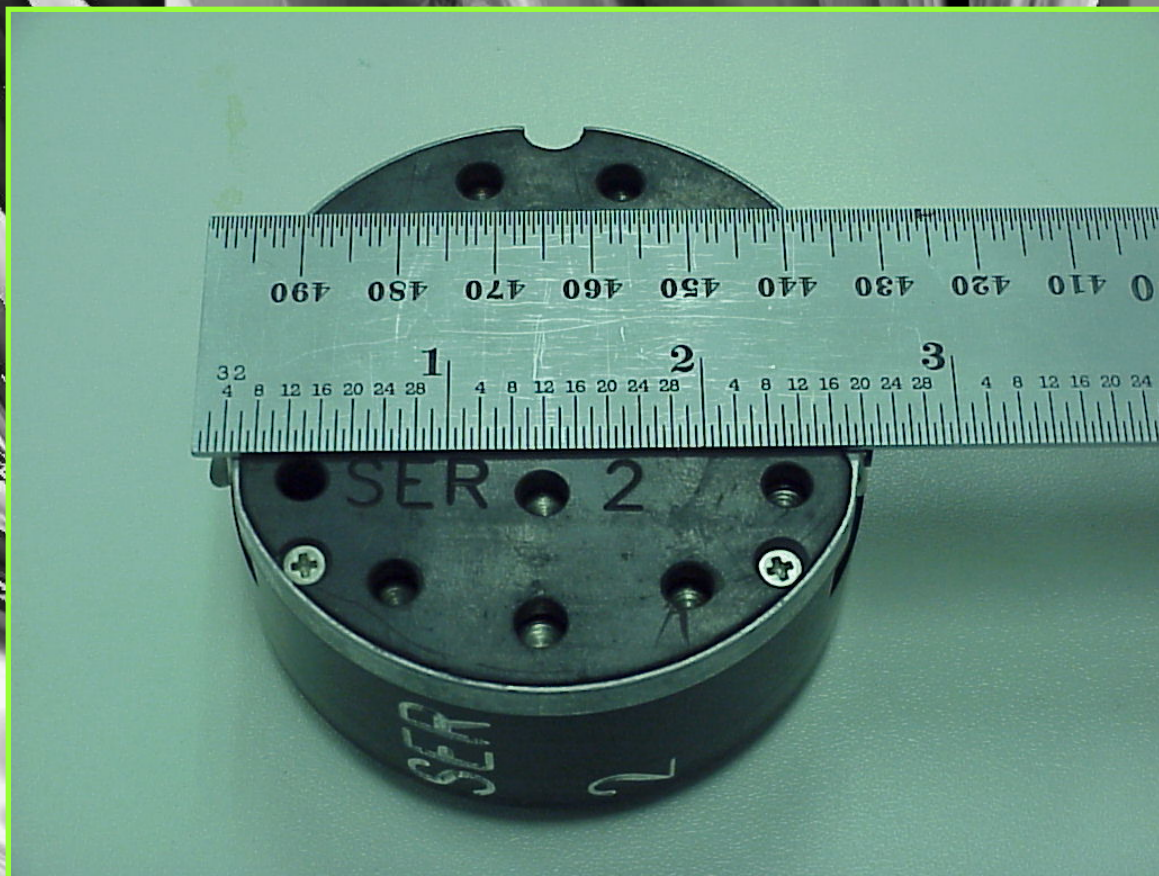
Puck sets are ordered from:

Peter Boyd, Boyd technologies, Box 95, Manchester, CA 95459.

Phone (707)-882-1630. Cell (707)-484-7571. Fax (707)-882-1745

E-mail: pbboyd@earthlink.net

*** request the SER-CAT modified PUCK**



The puck and lid has a diameter which requires the use of a Taylor-Wharton CX-100 dry shipper dewar.

The CX-100 dewar has a neck diameter of 2.78 inches (71mm) which accommodates the puck carrier loaded with 7 pucks (a 112 sample capacity per CX-100 dewar).



Taylor-Wharton CX100 dry shippers and CX10-8C00 shipping cases can be purchased from your Taylor-Wharton distributor.

<http://www.taylor-wharton.com/>